

A hitherto unknown organ in the Ancillary Appendages of the Lepidoptera (*Ageronia* sps.). (*With plate.*)

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(Translated by P. H. Muschamp, F.E.S.)

Among some mounts that M. Fruhstorfer had begged me to make to facilitate his studies, was one of the ♂ genitalia of an *Ageronia*, and I was surprised to find in this butterfly an organ unknown to me. M. Fruhstorfer has since then kindly handed me the abdomens of 26 species of this genus, and in all I have found the same organ; it belongs exclusively to the ♂.

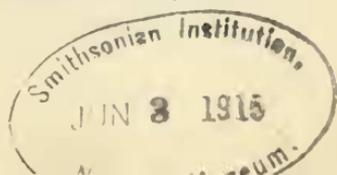
Here is a description of this organ: It is placed in the last section of the abdomen and is formed of a chitinous rod of varying length and springs from the upper-posterior angle of the 8th abdominal sternite. The form and curve of this rigid rod would appear to be constant; it bears at its extremity thick pointed chitinous spiculæ, varying in different species, and all along the rest of it fine hairs and a certain number of spiculæ, which in certain species are more abundant than in others. The rods are very long in certain species, shorter in others; they are rectilineal or slightly curved, generally strongly concave at foot, their extremity is often clubbed, sometimes imperceptibly; the upper border of the sternite seems to be thickened; it is both extended with the wand to its source and prolonged on its proximal side to a point considerably beyond the sternite (figs. 2 and 4).

When the genitalia are completely sheathed by the abdomen, the extremity of the rods extends beyond that of the abdomen, and in dry specimens these rods are easily broken off or deprived of their spiculæ; among the abdomens, which I received from M. Fruhstorfer, such accidents had been rather frequent.

Each species of the genus *Ageronia* possesses these organs and of a form peculiar to the species. The accompanying figures show the different types of rods, and it will be seen that the diagnosis of a species might be established by an examination of the rods alone. I must confess that I possess only one specimen each of many species, but those of which I have several specimens (four specimens apiece of five species, and two of several others), the form of the rods may be said to be constant, any slight difference in the mounts being due to a difference in their orientation. As I just observed, the spiculæ are liable to be broken off, but it is always easy to ascertain their true number by counting the little circles in the surface of the rods, for these are the points of insertion of the detached spiculæ. The examples of which I have had photographs made are naturally those which seemed to me to be most nearly intact. The spiculæ are generally densest at the extremity of the rods, but in certain species, e.g., *A. saurites* (fig. 5), they are dense throughout the whole length. The spiculæ terminate in pin points (figs. 5 and 6) or in lance-heads (figs. 1, 2, 3, and 4); and in some of the other species, the distal border of the sternite, below the spot where the rod is inserted, is furnished more or less abundantly with long, heavy spiculæ.

This peculiar *Ageronia* organ has not escaped observation; Godman

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and Salvin mention it but give no details other than* "There are two rods attached to the upper edge of the ventral portion of the terminal segment of the abdomen."

To sum up: This organ is peculiar to the ♂ and displays distinct characteristics in all the different species I have examined.

My colleague M. Jullien discovered an organ in certain *Satyridae*. This organ, called by Frubstorfer "Jullienische Organ," is composed of thick, chitinous, very darkly coloured rods with dentated or pointed extremities; these rods are inserted in the last abdominal tergite (not the sternite); they are found in *Satyrus alcyone*, *S. hermuone*, *S. syriaca*, and *S. semele*, and in *Epinephele jurtina*, in which latter there is one instead of three or more rods on either side; but this one rod is really formed by the soldering together of several into one multidentated rod. In *S. hermuone* and *S. alcyone* the insertion is made in a sort of wing detached from the lateral parts of the tergite, whereas in *E. jurtina* it is made on the slight prolongation of the somewhat flattened exterior angle of this sternite.

The analogy is evident if not close; it is true that the points of insertion and the dimensions of the rods are very different in *Satyrus* and in *Ageronia*. There is, however, analogy enough to cause us to suspect that their functions are similar.

Dampf thinks that Jullien's organs are scent organs, but Jullien himself believes them to be of a tactile order, and the latter hypothesis seems more in keeping with their constitution; it is hard to see how these thick rods can disperse a volatile substance.

A third solution of the problem suggests itself to me. I have read a remark by Fritz Müller incorporated in Dr. G. B. Longstaff's work.† "Just as the *Ageronia*, four species of which I had an opportunity of observing in some numbers during the past summer, only make the remarkable crackling sound on the wing and during the courtship, so also, in all probability, butterflies equipped with brands, tufts, etc., only distribute their scent under the same circumstances." May we not deduce that this crackling sound is caused by the friction of the spiculæ against other parts of the genitalia, and that the Jullien organ has the same function, the action being modified by their situation; it would seem almost as though the motionless organ of *Ageronia* were rubbed by the mobile valves, whereas the mobile spiculæ of the Jullien organ in *Satyrus* rub against the valves or uncus; the way in which the Jullien organ is inserted leads us to suppose that it can be moved at will. I submit my hypothesis to the numerous and clever English observers, and to the Swiss field-workers; they will perhaps tell me if *E. jurtina* and *S. alcyone* perform on the castanets as *Ageronia* does in order to charm its lady mate.

EXPLANATION OF PLATE II.

- Fig. 1. *Ageronia februa*, ♂, genitalia and Godman-and-Salvin organ.
 Fig. 2. *Ageronia arete*, ♂, 8th abdominal segment.
 Fig. 3. *Ageronia obidana*, ♂, 7th and 8th abdominal segments.
 Fig. 4. *Ageronia fritilla*, ♂, 8th abdominal segment.
 Fig. 5. *Ageronia saurites*, ♂, 8th abdominal segment.
 Fig. 6. *Ageronia sellasia*, ♂, 8th abdominal segment.

* "Biologia Centrali-Americana." *Insecta Lepidoptera Rhopalocera*, by F. D. Godman and D. Salvin. Vol. i., p. 268.

† *Butterfly-hunting in many Lands*. George B. Longstaff. p. 616.